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STUDIES ON FISHES OF THE FAMILY OPHIDIIDAE. III. A NEW SPECIES OF *LEPOPHIDIUM* FROM BARBADOS¹

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Among the collections of The Museum of Comparative Zoology, Harvard University, are two eusk eels collected off Barbados, British West Indies, during the operations of the Steamer "Blake." They represent a new species of *Lepophidium* which is described below.

LEPOPHIDIUM KALLION, sp. nov. (Figure 1)

Holotype. Museum of Comparative Zoology 28057A, a female, 117 mm. in standard length; collected in 200 fathoms "off Barbados," "Blake" station 291, presumably in February or March, 1879 (see Pierce and Patterson, 1879:15).

Paratype. MCZ 28057B (1), a male, 162 mm. in standard length; data as for holotype.

Diagnosis. Dorsal rays 133, anal rays 108; pectoral rays 23 or 24, gill rakers 10, vertebrae 74 (15 precaudal and 59 caudal vertebrae), pyloric caeca 6 (1 dorsally, 5 ventrally). Upper sides with dark brown markings in two series, the upper forming a longitudinal stripe on either side of the dorsal-fin base. Snout tip fringed with numerous fleshy projections.

Description. A healed injury at the caudal end of the paratype has resulted in the loss of about eight caudal vertebrae including the hypural plate. Counts of vertebrae and of rays in the vertical fins, listed in the diagnosis, are therefore based

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solely on the holotype. Pectoral rays number 23-23 (holotype) or 23-24 (paratype), the caudal rays 9. Three rudimentary gill rakers are on the upper arm of the first arch of both specimens and 6 or 7 developed rakers are on the lower arm. The holotype has an additional rudimentary raker on the lower arm; both specimens have a total of 10 gill rakers on the first arch. Branchiostegal rays number 7. The pyloric caeca are blunt, and number 6 (1 dorsally and 5 ventrally).

L. kallion possesses the general characteristics of *Lepophidium* (see Robins, 1959:361).

Morphometric data follow (in each instance the figure in parenthesis refers to the paratype): standard length, mm., 117 (162-damaged); head length 23.0(34.6); tip of snout to origin of dorsal fin, 27.8 (39.3); tip of snout to origin of anal fin, 42.8 (67.2); tip of snout to occiput, 15.5(22.5); tip of snout to posterior end of maxillary, 11.1 (15.8); depth of body, at occiput, 13.7 (23.2); at origin of dorsal fin, 13.0 (24.6), at origin of anal fin, 13.1 (20.7); length of pectoral fin, 11.4 (14.5); length of pelvic rays, 8.6 and 6.4 (12.4, 9.5); length of caudal fin, 7.1 (damaged); tip of snout to posterior end of lateral line, 112 (150); horizontal diameter of bony orbit, 3.5 (5.1); post-orbital length of head, 12.7 (19.5); snout length (to margin of orbit), 4.2 (6.5); bony interorbital, 3.5 (5.1).

Despite their age the distinctive color pattern is readily seen on the type specimens. The dorsal, caudal and anal fins are pale with scattered melanophores and with a well defined dark margin. The pectoral fin is clear with some melanophores on its basal third.

The body is almost straw-colored in preservative although the scattered melanophores lend a dusky appearance to the belly. Two series of dark brown markings on the upper sides dominate the body coloration. The uppermost series starts as a collar just behind the occiput, runs laterally to a point above the opercle and then extends as a dark stripe, just above the lateral line, most of the distance to the caudal-fin base (Fig. 1). It is broken posteriorly into a series of dashes. In the holotype the stripe is less continuous than in the paratype. The lower series of dark brown markings extends posteriorly from the shoulder as a series of elongate blotches, just below the lateral line. Caudally, the lower series crosses the lateral line and merges with the dorsal

series. Two dark spots occur on the nape between the dorsal-fin origin and the occipital collar. The head is generally dusky. A short dark bar extends from the upper end of the gill slit, rearward along the dorsal margin of the operculum. The snout is not spotted but a few dark spots may have been present on top of the head, behind the interorbital region. As seen from above, the dark margin of the dorsal fin appears to be a mid-dorsal stripe.

The floor of the mouth and the gill bars are pale and the gill chamber silvery with numerous melanophores. The roof of the mouth especially toward the pharynx is dusky but not black. The gastrointestinal tract is sooty black except for the stomach.



Figure 1. Lateral view of the paratype of *Lepophidium kallion*, MCZ 28057B, 162 mm. in standard length, collected off Barbados, "Blake" station 291.

As in other species of *Lepophidium*, the swimbladder is similar in both sexes, a rather thin-walled sac, with no posterior opening or tube. It occupies the dorsal portion of the body cavity.

Numerous short, pointed, non-depressible teeth are present on the premaxillary, dentary, vomer, palatines, and pharyngo-branchials. Those on the outer row of the premaxillary and dentary are best developed. The dentigerous areas are papillose, especially the lips. A prominent spine is easily detected under the skin on the snout and on the upper posterior margin of the opercle.

Scalation is typical of the genus. The scales are cycloid, imbricate and in regular rows on the body. The postorbital portion of the head is also scaled. In *L. kallion* the scales are imbedded

and the skin must be scraped away to determine the number of scale rows. About 8 and 25 rows are present between the lateral line and the dorsal- and anal-fin origins, respectively. Some 165-170 rows cross the lateral line between the posterior edge of the hypural plate and the point of opercular attachment. So many other characters are available to the systematist that the labor involved in approximate enumeration of scale rows in ophidiids seems unjustified.

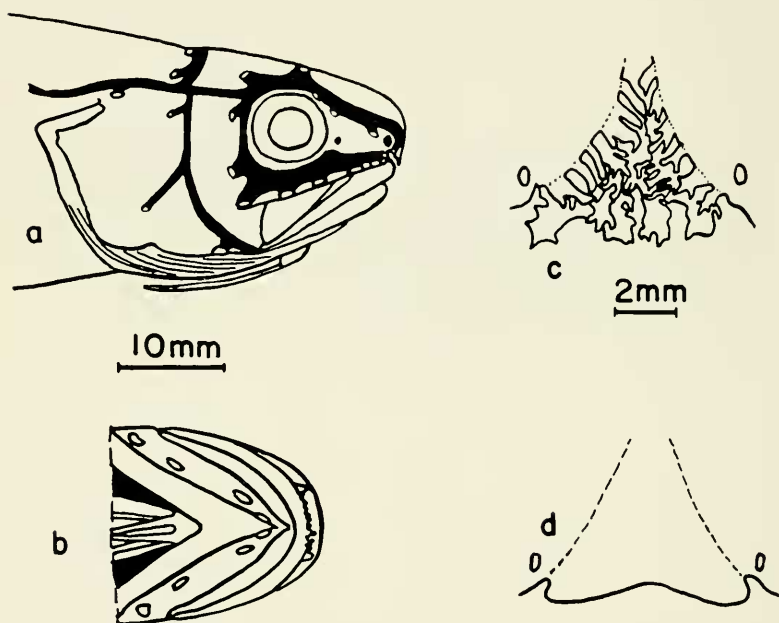


Figure 2. (a, b). Diagram of lateralis system on head of *Lepophidium kallion* (see text for explanation). (c). Development of fleshy tabs on tip of snout of *L. kallion*. (d). Tip of snout of *L. marmoratum* (Goode and Bean).

The lower rim of the snout is incised anterior to the nostrils. Four fleshy tabs project from this margin (Fig. 2 c). The actual shape of these tabs apparently varies, for the paratype is less

decorated than the holotype. Two rows of fleshy tabs run dorsally from in front of the anterior nostril and join just anterior to the rostral spine (Fig. 2 c).

Böhlke and Robins (in press) have demonstrated specific differences in the lateralis system on the head. In *L. kallion* this system may be divided into the lateral, supratemporal, supra-orbital, infraorbital and preoperculomandibular canals. Hubbs and Cannon (1935, pl. 2) provided illustrations of these canals in several darters and Robins and Miller (1957:216-217) similarly treated *Cottus*.

A schematic presentation of the lateralis system of *L. kallion* is given in Figure 2 (a, b). In the lateral view the canals are shown in black. A single pore occurs on the lateral canal just anterior to the attachment of the gill membrane. Three pores (one median) are on short caudally-projecting side canals extending from the supratemporal canal. Each supraorbital canal consists of six pores (one above and slightly behind the eye, one median coronal pore, two over the anterodorsal margin of the eye, one behind and above the anterior nostril and one opening caudally into the subnasal depression. Each infraorbital canal consists of eight pores (one behind the eye, one behind and below the eye, one at the posterior end of the suborbital rim, four on the suborbital rim above the jaw, and one opening anteriorly into the subnasal depression. The preoperculomandibular canal is more difficult to trace on the type material of *L. kallion*, especially on the sides of the head. Apparently it opens through 6 pores. The four pores along the ramus of the lower jaw are large and easily seen (Fig. 2 b). One tiny pore opens off a side canal just below the junction of the preoperculomandibular canal with the lateral canal. Another pore opens off a long side canal on the lower third of the operculum. In at least one other species of *Lepophidium* a second pore occurs below this one but it could not be found in *L. kallion*.

The posterior nostril is nearly on the anterior rim of the orbit and is small and circular. The larger anterior nostril opens through a short tube, above the subnasal depression, near the anterior end of the snout.

The name is from the Greek *kallion*, meaning more beautiful, and refers to the distinctive pattern of this species in contrast to the more drab species of *Lepophidium*.

Relationships. Serious consideration need be accorded only *L. marmoratum* (Goode and Bean). Other Atlantic species were briefly mentioned by Robins (1959:366-367). *L. marmoratum* differs from *L. kallion* in many features. 1) The upper sides are spotted instead of striped. 2) The upper half of the head and the snout are spotted. 3) It possesses more gill rakers, usually 11, occasionally 12 or 13. 4) The longer division of the pelvic ray is considerably longer than the pectoral fin. 5) Probably, there are fewer dorsal rays (121-129) and, 6) fewer pyloric caeca (3-5). 7) The snout is smooth, its lower rim entire (Fig. 2 d) without any of the numerous fleshy tabs of *kallion*. 8) A subnasal pore is present on the infraorbital canal just below the posterior nostril.

L. kallion and *L. marmoratum* are intimate species within the framework of the genus. The color patterns of the two although quite different are of a similar nature, quite unlike that of *L. staurophor* Robins, *L. jeannae* Fowler or *L. cervinum* (Goode and Bean). The pigmentation of the gut, peritoneum, and oral and branchial chambers are the same, a distinctive combination. The gill rakers are similar, those on the lower arm diminishing gradually in size instead of shifting from equally developed rakers to rudiments.

More detailed consideration of *marmoratum* is beyond the scope of this paper.

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